LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: Exposure Control Operations in a Fallout Environment

TRAINING METHOD: Lecture

REFERENCES: AFMAN 32-4005, Personnel Protection and Attack Actions
Allied Tactical Publications 45
Army Field Manual 3-6, Field Behavior of NBC Agents, 3 November 1986
Army Field Manual 3-12, Operational Aspects of Radiological Defense, August 1968
J3ALP3E931 003, Disaster Preparedness Apprentice Course, Fort McClellan, Alabama

AIDS AND HANDOUTS: Attachment 1. Sample Shelter Radiological Log
Attachment 2. Sample Individual Radiological Log
PIN 606051DF (J Block), Exposure Control Operations in a Fallout Environment

LESSON OBJECTIVE: Given a lecture on exposure control operations in a fallout environment, the student, during the final course exam, must be able to perform both task steps and demonstrate mastery of at least three samples of behavior listed below:

TASK STEPS:

1. Complete Shelter Radiological Log.

2. Complete Individual Radiological Dose Record.

SAMPLES OF BEHAVIOR:

1. Identify the types of radiation produced after a nuclear detonation.

2. Identify the primary radiation hazard after a nuclear detonation.

3. Define the terms dose and dose rate.

4. Identify the maximum allowable dose for people exposed to wartime radiation.

5. State the procedures used in recording shelter dose.

Supersedes DPTP D3 15 August 1991
OPR: HQ AFCESA/CEXR (TSgt Deana M. Gunger) Certified by: HQ AFCESA/CEX (Col R. L. Turner)
Pages: 39/Distribution: F

6. Identify the person responsible for maintaining the Individual Radiological Dose Record.

ORGANIZATIONAL PATTERN: Topical

SUGGESTED COURSE(S) OF INSTRUCTION:

STRATEGY: This lecture presents basic information on exposure control procedures. Emphasize the differences between the terms dose and dose rate. Stress the maximum permissible dose for wartime planning and that this limit may be increased by the commander to meet the mission needs.

When explaining the Shelter Radiological Log examples and when students complete the Task Steps from Part III, emphasize that the doses given were from dosimeters that were never zeroed. Therefore, when students average the dose for that hour, it actually is the cumulative dose for the entire period up to that point. When completing the Task Steps from Part III, query students if they fail to note that one part of shelter is “hotter” (dosimeter C) that the other and ask them what actions should be taken.

To help explain the use of the radiological logs, make copies of Attachments 1 and 2. You may use these attachments as handouts, overhead transparencies, or in combination. Since the individual is responsible for recording their own individual doses, this training package applies to both base populace and shelter management team training. For base populace training use Main Points 1, 2, 3, and 6.

LESSON OUTLINE:

MAIN POINT 1. SOURCES OF RADIATION
- A. Initial Radiation
- B. Fallout

MAIN POINT 2. FALLOUT HAZARDS

MAIN POINT 3. UNITS OF MEASUREMENT
- A. Centigray Vs Roentgen
- B. Dose Vs Dose Rate
- C. Reading Dose and Dose Rate

MAIN POINT 4. EXPOSURE CONTROL GUIDELINES
- A. 150 Centigray Planning Unit
- B. Develop Logs
- C. Shelter Radiological Log
- D. Rotation of Shelters and Shelterees

MAIN POINT 5. RECORDING RADIATION DOSE

A. Use of Dosimeters
B. Initial Entry
C. Hourly Entries
D. Zero Dosimeters at One-half Maximum Value

MAIN POINT 6. RECORDING INDIVIDUAL DOSES

A. Individuals Annotate Records
B. One Dosimeter per Departing Member/Team
C. Annotate Record Before Departure
D. Annotate Record After Return
E. New Record

MAIN POINT 7. DISPOSITION OF RECORDS

MAIN POINT 8. PROJECTION CALCULATIONS

A. ATP 45
B. Protection Factors
C. Transmission Factors

PART II
TEACHING PLAN
INTRODUCTION

ATTENTION:	You have just received word to start monitoring for radiation and to implement exposure control procedures.
MOTIVATION:	If this order were actually given, would you know how to implement exposure control? Which forms do you use when documenting exposure control? Which base agency receives the completed exposure control documents?
OVERVIEW:	In this lesson we'll cover: 1. Sources of radiation 2. Fallout hazards. 3. Units of radiological measurement. 4. Exposure control guidelines. 5. Recording radiation dose. 6. Recording individual doses 7. Disposition of records. 8. Projection calculations.
TRANSITION:	Let's begin by taking a look at the sources of radiation.

BODY

MAIN POINT 1.

In simple terms, radiation sources following a nuclear detonation are categorized as initial radiation and fallout.

A. INITIAL RADIATION

Initial radiation is produced within one minute after the detonation. Most radiation produced by a nuclear weapon is released at this time and is very limited in range.

A lethal exposure to initial radiation is not a main concern during shelter operations. Anyone close enough to receive a lethal dose would probably be killed by the blast or heat.

INITIAL RADIATION IS EMITTED WITHIN ONE MINUTE OF THE EXPLOSION

Initial radiation is emitted within 1 minute after the explosion. It consists mainly of gamma rays and neutrons. Approximately
3-5 percent is initial nuclear radiation. People who survive the immediate effects of a nuclear detonation are probably exposed to residual radiation. This residual radiation is emitted from nuclear fallout particles.

1) THE EXPLOSION

When a nuclear explosion occurs, the result is the well known mushroom shaped cloud. This cloud may extend tens of thousands of meters and in the case of a surface burst or shallow burst, it is a huge vertically developed aerosol cloud bearing radioactive materials.

2) THE BLAST WAVE

The blast wave from a detonation produces devastating effects. The basic effects are most severe near the detonation and decrease as distance increases. Blast wave development depends on the detonation height and the incident and reflected waves.

The blast wave with its accompanying drag effect travels outward from the burst. Intense thermal radiation emits from the fireball, causing heating and combustion of objects in the surrounding area.

3) RESULTING FALLOUT

The effect of wind speed and direction at various altitudes is of particular interest. These factors are of great importance in predicting the location(s) of fallout that result from the explosion.

4) NUCLEAR DETONATION CAUSES THREE EFFECTS

The initial temperature of the fireball ranges into millions of degrees and the initial pressure ranges to millions of atmospheres. Most of the energy from a nuclear weapon detonation appears in the target area in the form of three distinct effects.

BLAST WAVE, THERMAL AND NUCLEAR RADIATION

These include the blast wave, thermal radiation, initial and residual radiation. The energy from a nuclear weapon explosion is distributed as follows: 50% blast effect, 35% thermal radiation, and 15 % nuclear radiation or radioactive fallout.

THERMAL RADIATION CAN START FIRES AND CAUSE BURNS AT GREAT DISTANCES

Thermal radiation can start fires and cause burns at great distances. The amount of thermal radiation varies with the weapon yield and the distance from the explosion.

GROUND ZERO RECEIVES THE MOST DAMAGE

The area around ground zero receives the most damage. Destruction due to the blast and accompanying fires is so great that the survival of inhabitants in conventional structures is improbable.

B. FALLOUT

Fallout contains radioactive particulate matter which produces casualties and in many cases material damage. Significant fallout occurs when the turmoil settles down and the radioactive particles begin to fall back to the ground.

The amount of fallout distribution over the land depends on many factors, such as: the weapon's yield, height of the burst, wind speed and direction, clouds and air density, terrain, and the weather.

WEATHER AND TERRAIN EFFECT INITIAL AND RESIDUAL RADIATION

The effects of weather and terrain apply to both the initial and residual effects of nuclear explosions, although we will primarily address residual aspects.

1) LOCAL FALLOUT

Most of the initial fallout will settle to the ground within 24 hours after detonation. This is local fallout and consists of particles large enough to be seen with the naked eye.

2) DELAYED FALLOUT

Delayed fallout consists of lighter particles remaining in the air after 24 hours. These particles can stay in the atmosphere for several weeks or months before reaching the ground.

MAIN POINT 2.
FALLOUT HAZARDS

Although alpha and beta particles are present in fallout, the primary operational hazard is gamma ray (ionizing radiation) exposure. Gamma rays present a hazard because they penetrate the body and damage internal organs. For the remainder of this lesson, we will only concentrate on gamma radiation exposure.

TRANSITION:

Let's discuss the terms associated with the measurements of radiation.

MAIN POINT 3.
UNIT OF MEASUREMENT

You use different units of measurement to measure dose rate and radiation intensities.

A. CENTIGRAY

We measure gamma radiation amount or the dose that a person receives, in "centigrays." You measure gamma ray strength or intensity at a point in time by "centigrays per hour".

While most radiation detection, identification, and computation (RADIAC)devices read intensities, as roentgens per hour, the terms centigray and roentgen are interchangeable.

B. DOSE AND DOSE RATE

There are two very important terms to become familiar with when working with RADIAC equipment, these are the dose and the dose rate.

1) DOSE

Dose is the amount of radiation--measured in centigrays--received by a person over a period of time. Dose is very similar to the odometer of your automobile, which tells you the total number of miles that vehicle has accumulated. Dose indicates the total amount of radiation exposure you have accumulated.

2) DOSE RATE

Dose rate is the amount of radiation intensity--measured in centigrays per hour (cGy/Hr)--at a specific period in time.

⇒ Dose rate is similar to the speedometer of your automobile, which tells you how fast you are traveling at that period in time.

⇒ Dose rate indicates the intensity of radiation you receive at that period in time.

There are two ways to determine the expected dose rate for an arbitrary time in the future. Mathematical and nomogram method.

3. TOTAL DOSE

The dose rate of radiation does not directly determine whether or not personnel become casualties. Casualties are dependent on total dose received.

If the dose rate were constant, total dose would simply be the product of dose rate and time in the contaminated area. The actual dose received is always less than the product of the dose rate at the time of entry and duration of stay.

4. DIFFERENCE BETWEEN DOSE RATE AND DOSE

By using an example, we can better understand the difference between dose and dose rate and the importance of using the dosimeter to measure dose.

⇒ As you travel down the interstate, your speedometer (RADIAC) indicates 65 mph, one hour later you again look at your speedometer (RADIAC) and it indicates 65 mph. If you average the speed and time, you compute 65 miles.

⇒ How far did you travel in that hour? The odometer (dosimeter) will give the exact number of miles traveled without this computation.

C. READING DOSE AND DOSE RATE

It is important to know the difference between dose and dose rate. Read doses directly from dosimeters. Dose applies to exposure control and is recorded on the applicable forms. Read dose rates directly from RADIACs. Use dose rates to determine peak radiation and/or recording a history of radiation intensities.

Meaningful "dose rate" and "total dose" calculations cannot be performed until the decay rate is known. The true decay rate is not known immediately and depends on several factors. Some of these factors include:

- ⇒ Height and type of burst
- ⇒ Type of weapon
- ⇒ Type of active materials as well as construction and structural materials within the weapons
- ⇒ Type and quantity of materials vaporized or sucked up into the fireball
- ⇒ When fallout overlaps fallout
- ⇒ Soil type

The decay rate also varies with time. It is not constant. Generally, the decay rate becomes slower as time passes. Decay calculations are valid only if the dose rate reading is made after "peak" has been reached. (expected to cease)

The radiation readings will be highest when all the fallout has stopped falling, just as the depth of snow is highest once it has all stopped falling. Hence, the "peak" has been reached.

INTERIM TRANSITION

We can sum up the purpose of exposure control operations by saying we want to expose the minimum amount of people to the minimum amount of risk for the minimum amount of time.

1) 2/4/6 RULE

Before we go any further-let's discuss a couple of rules for exposure:

2/4/6 Rule

"200"- 50% of the people will be okay;
50% will be sick.

"400" - 50% will be sick; 50% will die.

"600" - all personnel will die.

2) 7-10 RULE

7-10 Rule
For every 7 fold increase in time, radiation decreases to one tenth its former value.

A. 150 CENTIGRAY PLANNING LIMIT

Since factors such as sex, age, health, and previous exposure levels influence radiation effects, no precise guidelines apply equally to everyone in all circumstances.

The effectiveness of the exposure control program depends on knowing how much radiation people have been exposed to, what the effects are, and how to limit excessive exposure. For planning purposes, the total accumulated dose should not exceed 150 centigrays per person.

However, the installation commander has the authority to adjust the limit, as necessary, to ensure critical mission operations are met.

B. DEVELOP LOGS

Use local forms or general purpose worksheets to develop radiological logs and individual radiological dose records.

C. SHELTER RADIOLOGICAL LOGS

After fallout arrives, the shelter management team records radiological dosages at regular 60-minute intervals on a shelter radiological log. This information may be used to plan future military operations.

D. ROTATE SHELTEREES

If radiation levels vary significantly inside the shelter, rotate the shelterees through various shelter areas to help equalize exposure.

E. UNABLE TO ROTATE SHELTEREES

If there are wide radiation variances within the shelter that cannot be resolved through rotation, keep individual records on shelterees instead of a master radiation dosage record for the shelter.

MAIN POINT 5. RECORDING RADIATION DOSE

The shelter management team maintains the master radiation dosage record on the shelter radiological log.

A. USE OF DOSIMETERS

To do this, place dosimeters at several locations inside the shelter and record the average reading on the shelter radiological log. Dosimeters are our primary method for determining personnel exposure to radiation.

INSTRUCTOR'S NOTE: Explain the importance for conservation of dosimeters. Based upon AS 459, the basis of issue for dosimeters is ten per shelter, if FEMA equipment is not available.

B. INITIAL ENTRY

Enter the date and time on the shelter radiological log that fallout was confirmed with a RADIAC.

C. HOURLY ENTRIES

One hour after initial fallout arrival, enter the date and time on the shelter radiological log. Take dosimeter readings on all dosimeters in the shelter and record the average reading from all of the dosimeters on the radiological log. Continue to read and average dosimeters each hour.

D. ZERO DOSIMETERS AT ONE-HALF MAXIMUM VALUE

Charge (zero) dosimeters when they reach one-half of their maximum value and annotate “zeroed” in the remarks column of the shelter radiological log. Calculate and continue to enter the total accumulated dosage after each reading.

INSTRUCTORS NOTE: At this time, present a copy of Attachment 1 to all students. Use this attachment and sample problem to demonstrate the required entries on the Shelter Radiological Log.

MAIN POINT 6. RECORDING INDIVIDUAL DOSES

Many of the people from your shelter will be deploying outside the shelter to perform mission related duties. To help ensure they do not exceed prescribed radiation dosages, each person maintains their own radiological dose record. Each person enters his or her personal data and assigned shelter on the record.

A. INDIVIDUALS	People complete this record before they depart from , and immediately after their return to a shelter, or upon completion of shelter operations. The record is designed for multiple uses before a new record is needed.
B. ONE DOSIMETER PER DEPARTING MEMBER/TEAM	Charge (zero) and issue one dosimeter to each person or group (if they will be working in the same general area).
	INSTRUCTORS NOTE: At this time, present Attachment 2 to all students. Use this to demonstrate the required entries on the Individual Radiological Dose Record.
C. ANNOTATE RECORD BEFORE DEPARTURE	Each person must complete the following items on the individual radiological dose record before departing the shelter:
1) LOCATION	Location: Enter the shelter number the individual is departing from.
2) DATE/TIME	Date/Time: Enter the period of time the person was in the shelter beginning “FROM” the time of fallout arrival to “TO” the time the person departs.

3) DOSE THIS PERIOD

Dose this period: Enter the accumulated dose received while in the shelter in "DOSE THIS PERIOD". Obtain this information from the shelter radiological log and supplement it with a final dosimeter reading if it has been more than 30 minutes since the last dose entry on the shelter radiological log.

4) TOTAL DOSE

Enter the total accumulated dose the individual has already received at this departure time in "TOTAL DOSE".

INSTRUCTORS NOTE:
Emphasize that the "Return Before Dosimeter Reads" block indicates the maximum allowable dose that a person should not exceed while outside of the shelter during that period.

5) RETURN BEFORE DOSIMETER READS

Return Before Dosimeter Reads: In the column following total dose we indicate the maximum allowable dose that the person should not exceed while working outside.

The exposure control monitor provides this number (subtract the "TOTAL DOSE" from the commander's allowable dose, usually 150 centrigrays). This entry lets the individual know to return to the shelter before reaching the prescribed dose.

6) TOTAL ALLOWABLE DOSE MINUS TOTAL EXPOSURE ANTICIPATED

If the individual anticipates numerous trips outside the shelter, the allowable dose for that individual must consider the total allowable dose, minus the total exposure anticipated during each trip. The individual keeps the record while outside the shelter.

D. ANNOTATE RECORD AFTER RETURN

Each person must complete the following items on their individual radiological dose record immediately after returning to a shelter:

1) LOCATION

LOCATION: Enter "OUTSIDE" in the location block.

2) DATE/TIME

DATE/TIME: Enter the time the person departed in the "FROM" block (should be the same as the "TO" block of the preceding line entry). Next, enter the date and time the individual returned in "TO" block.

3) DOSE THIS PERIOD

DOSE THIS PERIOD: Enter the reading from the dosimeter carried by the individual (or by the team/group), at the time of return in "DOSE THIS PERIOD."

4) TOTAL DOSE

Add the dose received while outside to the "TOTAL DOSE" annotated on the previous line and put the new total in "TOTAL DOSE". This will allow immediate determination of the total dose accumulated by the individual.

E. NEW RECORD

Each person must start a new record when he or she completely fills out their individual radiological dose record. List the last "TOTAL DOSE" entry on a new record and retain the old record until no longer needed.

MAIN POINT 7. DISPOSITION OF RECORDS

When deactivating the shelter, the unit commander collects all shelter radiological logs and individual radiological dose records and gives them to the Director of Base Medical services.

MAIN POINT 8. PROJECTION CALCULATION

For the first time since approximately 1986 the USAF has a reference for radiological exposure control-projection calculations.

PRIOR TO 1986

Before this time we used formulas and nomograms to help determine future radiation intensities, the optimum time to leave shelters, etc. From 1986 to the present we relied on dosimeters as our only method of exposure control.

A. ATP 45

However, the US ratified the latest version of ATP 45 and several radiological calculations. Remember that the primary purpose behind all these calculations is one of projections into the future for planning purposes.

We can use "total dose" nomograms contained in Annex A of ATP 45 to determine the expected dose, time of entry, and stay time. These particular nomograms are located at pages A-27 through A-45.

CALCULATIONS BASED ON A SINGLE NUCLEAR BURST

These calculations are based on a single nuclear burst. When multiple bursts deliver fallout, the projections can become unreliable.

BASED ON EQUAL INTENSITY

The projection calculations are based on "equal" intensity throughout an area; there will be hot spots and locations of lesser contamination throughout the area.

SHIELDING NOT CONSIDERED

These calculations do not take "shielding" into consideration i.e., if a person walks behind a wall, the wall will shield them from part of the radiation.

THERE ARE CALCUATIONS FOR AN ITEM'S PROTECTION AND TRANSMISSION FACTORS

These are mathematical indications of how much protection a given item (building or vehicle for instance) is providing personnel from the effects of gamma radiation. For our purpose we can call these terms representation of the shielding factor an item or structure provides.

THESE CALCULATIONS ARE IMPORTANT FOR TWO REASONS

There are two reasons these type of calculations are important to us. The first is that we can use these figures to indirectly calculate outside dose rates while we remain inside our protective structure. The second is to determine what facilities, structures, or areas provide the best personnel protection against gamma radiation.

Within the USAF we primarily use the term protection factor. NATO uses the term transmission factor. In both cases, the individual must know the inside reading and the outside reading in order to determine either the protection or transmission factor.

Whether we use the term protection factor or the term transmission factor, you need to realize the actual radiological effect on the person is the same. These terms are just two different mathematical ways to look at the shielding provided by an item.

B. DETERMINING PROTECTION FACTOR

An item's Protection Factor is determined by dividing the outside reading by the inside reading. Example, if the outside reading was 2 cGy/hr, the protection factor would be 50. In essence this means people outside are receiving 50 times more exposure than the people inside.

$$\text{Protection Factor} = \frac{\text{Outside Reading}}{\text{Inside Reading}}$$

C. DETERMINING TRANSMISSION FACTOR

An item's Transmission Factor is determined by dividing the inside reading by the outside reading. For example, if the outside reading was the same 100 cGy/hr and the inside reading was the same 2 cGy/hr, the transmission factor would be .02. In essence, this means people inside are receiving only 2 percent of the exposure people outside are receiving.

$$\text{Transmission Factor} = \frac{\text{Inside Reading}}{\text{Outside Reading}}$$

TO MINIMIZE EXPOSURE

In order to minimize the radiological hazard to personnel, shelter management teams should only take outside readings until sufficient radiation exists to produce an inside reading.

Once that level has been reached, the protection factor or transmission factor can be calculated.

From that point onward, unless physical damage to the structure changes the protection/transmission factor, there isn't a need to go outside again to obtain a reading. In fact, going outside at this point needlessly exposes personnel to higher intensities of radiation.

INTERNAL SUMMARY

As stated earlier, the two primary applications we have for protection factors:

1. To determine the outside dose rate while we are still located inside the protective structure. Use the following formula.

Outside Dose Rate - Inside Dose Rate x Protection Factor

2. To house personnel in the most protected portions of the shelter. We accomplish this by determining the protection factor for various parts of the building and setting up shelter assignments accordingly.

DOSIMETER REMAINS THE MOST ACCURATE

Though we have such calculations available, the dosimeter is still your best bet when trying to determine the actual radiological exposure received by personnel.

CONCLUSION

SUMMARY:	During this lesson, we addressed: 1. Sources of radiation. 2. Fallout hazards. 3. Units of radiological measurement. 4. Exposure control guidelines. 5. Recording radiation dose. 6. Recording individual doses. 7. Disposition of records. 8. Projection calculations.
REMOTIVATION:	The effective use of the exposure control program is an important one. Your life and the lives of others are now in your hands. Remember, your effective use of the exposure control program is instrumental in helping the installation commander accomplish the mission.
CLOSURE:	This concludes this lesson.
TRANSITION:	(Develop locally to transition to the next topic.)

PART III
EVALUATION
STUDENT PERFORMANCE STANDARDS

TEST ITEMS

---

1. LESSON OBJECTIVE: Identify the sources of radiation produced after a nuclear detonation.

QUESTION: (Multiple Choice)

Radiation sources following a nuclear detonation are categorized as:

a. Initial radiation and fallout
b. Fallout and delayed radiation
c. Delayed and early radiation
d. Immediate fallout and delayed radiation

KEY: a.

REFERENCE: MAIN POINT 1

---

2. LESSON OBJECTIVE: Identify the primary radiation hazard after a nuclear detonation.

QUESTION: (Multiple Choice)

Which type of radiation is the primary operational concern after a nuclear detonation?

a. Alpha
b. Beta
c. Gamma
d. All of the above

KEY: c.

REFERENCE: MAIN POINT 2

---

3. LESSON OBJECTIVE: Define the terms dose and dose rate.

QUESTION: (True or False)

The term dose means the amount of radiation intensity at a given time.

a. True
b. False

KEY: b.

REFERENCE: MAIN POINT 3

---

4. LESSON OBJECTIVE: Identify the maximum accumulated dose for people exposed to wartime radiation.

QUESTION: (Multiple Choice)

For wartime planning purpose, what is the maximum accumulated dose?

a. 100 centigrays
b. 150 centigrays
c. 200 centigrays
d. 250 centigrays

KEY: b.

REFERENCE: MAIN POINT 4

---

5. LESSON OBJECTIVE: State the procedures used in recording shelter dose.

QUESTION: (Multiple Choice)

Which of the following statements identify the entries to be included on the Shelter Radiological Log?

a. When fallout has been confirmed with radiation detection instruments, enter the date and time on the Shelter Radiological Log.
b. Take dosimeter readings on all dosimeters in the shelter and record the average reading on the Shelter Radiological Log.
c. One hour after initial fallout arrival, enter the date, time, and average dose on the Shelter Radiological Log.
d. All of the above.

KEY: d.

REFERENCE: MAIN POINT 5

---

6. LESSON OBJECTIVE: Identify the person responsible for maintaining the Individual Radiological Dose Record.

QUESTION: (Multiple Choice)

Who is responsible for maintaining Individual Radiological Dose Records upon exposure?

a. Readiness Office personnel
b. Shelter Management Team
c. Unit Control Center
d. Exposed Individual

KEY: d.

REFERENCE: MAIN POINT 6

PART IV
RELATED MATERIALS

Attachment 1. Sample Shelter Radiological Log

Attachment 2. Sample Individual Radiological Dose Record

SAMPLE SHELTER RADIOLOGICAL LOG

You are a member of the shelter team assigned to shelter 123. Your shelter was activated on 28 December at 1300 Hrs. A nuclear exchange occurred on 31 December and you were directed to begin fallout monitoring. Fallout was detected at 1200 Hrs on 1 January and your RADIAC indicates 350 cGy/hr. All three of your dosimeters placed throughout your shelter indicate zero.

1 January 1997

1300 Hrs the average of the three dosimeters is 5 cGy.

1400 Hrs dosimeter A indicates 9 cGy, dosimeter B indicates 15 cGy, and dosimeter C indicates 12 cGy.

1500 Hrs dosimeter A indicates 11 cGy, dosimeter B indicates 17 cGy, and dosimeter C indicates 14 cGy.

1600 Hrs the average of the three dosimeters is 17 cGy.

1700 Hrs Dosimeter A indicates 16cGy, dosimeter B indicates 21 cGy, and dosimeter C indicates 20 cGy.

LAPSE OF TIME TO NEXT DAY

2 January 1997

1800 Hrs the average of the three dosimeters is 65 cGy.

1900 Hrs dosimeter A indicates 63 cGy, dosimeter B indicates 67 cGy, and dosimeter C indicates 71 cGy.

2000 Hrs dosimeter A indicates 64 cGy, dosimeter B indicates 68 cGy, and dosimeter C indicates 72 cGy.

INDIVIDUAL RADIOLOGICAL DOSE RECORD

LOCATION	PERSONAL DATA	DATE/TIME FROM	DATE/TIME TO	DOSE THIS PERIOD	TOTAL DOSE	RETURN BEFORE DOSIMETER READS
Bldg 123	John Doe, AFSC 2S071, AFDPRC	1 Jan 1200	1 Jan 1500	14	14	136
Outside		1 Jan 1500	1 Jan 1800	22	36	------
Bldg 123		1 Jan 1800	2 Jan 0600	25	61	89
Outside		2 Jan 0600	2 Jan 0900	15	76	------
Bldg 123		2 Jan 0900	2 Jan 1930	7	83	67

NOTE: This sample form need not be typed.

SAMPLE INDIVIDUAL RADIOLOGICAL DOSE RECORD

Complete Individual Radiological Dose Record using the following information.
NOTE: Dosimeter was never zeroed.

You are in Building 123.

1 January 1997

1200 Hrs John Doe arrives at shelter. At 1500 Hrs, John Doe (AFSC 2S051, SSAN 123-45-6789) was tasked to leave the shelter and report to the battle staff in the command post (Building 321). The dose from 1200 Hrs to 1500 Hrs is 14 cGy.

1800 Hrs the dose from shelter 123 is 22 cGy. John Doe returnes to shelter 123 at 1800 Hrs, his dosimeter indicates 36 cGy.

2 January 1997

0600 Hrs the dose for shelter 123 is 47 cGy. John Doe is tasked once again to report to the battle staff.

0900 Hrs the dose for shelter 123 is 57 cGy. John Doe returns to shelter 123 at 0900 Hrs, his dosimeter indicates 62 cGy.

1930 Hrs the dose for shelter 123 is 64 cGy. John Doe was tasked to leave the shelter to meet with the Base Commander.

SHELTER RADIOLOGICAL LOG for Building 123

FALLOUT ARRIVAL Date: 1 JAN 97
Time: 1200

REMARKS/EVENTS	DATE	TIME	AVG.DOSE
	1 Jan	1300	5
	“	1400	12
	“	1500	14
	“	1600	17
	“	1700	19
	-------	-------	-------
	-------	-------	-------
	2 Jan	1800	65
	“	1900	67
	“	2000	68

NOTE: This sample form need not be typed.

TRAINING PACKAGE COMMENT REPORT

RTP #	RTP DATE

To get an *immediate response* to your questions concerning subject matter in this Readiness Training Package (RTP), call the author (listed on the front cover) or the Contingency Training Section at DSN 523-6458 between 0700-1600 (CT), Monday through Friday. Otherwise, write, fax, or E-mail the author to make comments, suggestions, or point out technical errors in the area of: references, body information, performance standards, test questions, and attachments.

NOTE: Do not use the Suggestion Program to submit corrections for printing or typographical errors.

Comments:____

____

____

____

____

HQ AFCESA/CEX FAX #: DSN 523-6383
Internet: childsr@afcesa.af.mil
HQ AFCESA Home Page: http://www.afcesa.af.mil

---FOLD HERE---

OFFICIAL BUSINESS

HQ AFCESA/CEXR
ATTN: TSGT CHILDS
139 BARNES DRIVE SUITE 1
TYNDALL AFB FL 32403-5319